

AIR FORCE QUALIFICATION TRAINING PACKAGE (AFQTP)



**for
PAVEMENTS AND CONSTRUCTION EQUIPMENT OPERATOR
(3E2X1)**

**MODULE 18
SWEEPERS**

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SWEEPERS

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Career Field Education and Training Plan (CFETP) references from 1 Apr 97 version.

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Notice. This AFQTP is NOT intended to replace the applicable technical references nor is it intended to replace hands-on training. It is to be used in conjunction with these for training purposes only.

AIR FORCE QUALIFICATION TRAINING PACKAGES
for
PAVEMENTS AND CONSTRUCTION EQUIPMENT OPERATOR
(3E2X1)

INTRODUCTION

Before starting this AFQTP, refer to and read the “Trainee/Trainer Guide” located on the AFCESA Web site <http://www.afcesa.af.mil/>

AFQTPs are mandatory and must be completed to fulfill task knowledge requirements on core and diamond tasks for upgrade training. *It is important for the trainer and trainee to understand* that an AFQTP ***does not*** replace hands-on training, nor will completion of an AFQTP meet the requirement for core task certification. AFQTPs will be used in conjunction with applicable technical references and hands-on training.

AFQTPs and Certification and Testing (CerTest) must be used as minimum upgrade requirements for Diamond tasks.

MANDATORY minimum upgrade requirements:

Core task:

AFQTP completion
Hands-on certification

Diamond task:

AFQTP completion
CerTest completion (80% minimum to pass)

Note: *Trainees will receive hands-on certification training for Diamond Tasks when equipment becomes available either at home station or at a TDY location.*

Put this package to use. Subject matter experts under the direction and guidance of HQ AFCESA/CEOF revised this AFQTP. If you have any recommendations for improving this document, please contact the Career Field Manager at the address below.

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MULTI-PURPOSE SWEEPERS

MODULE 18

AFQTP UNIT 3

PERFORM OPERATIONAL CHECKS (18.3.1.)

PERFORM OPERATOR MAINTENANCE (18.3.3.)

PERFORM OPERATIONAL CHECKS

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PERFORM OPERATOR MAINTENANCE

Task Training Guide

STS Reference Number/Title:	18.3.1. Perform Operational Checks 18.3.3. Perform Operator Maintenance
Training References:	<ul style="list-style-type: none"> • 36C25 Series • Owner's Manual • Local Procedures
Prerequisites:	<ul style="list-style-type: none"> • Possess as a minimum a 3E2X1 AFSC
Equipment/Tools Required:	<ul style="list-style-type: none"> • Multi-purpose Sweeper • Personal Protective Equipment • General Tool Kit
Learning Objective:	<ul style="list-style-type: none"> • The trainee will be able to properly check out a multipurpose sweeper
Samples of Behavior:	<ul style="list-style-type: none"> • The trainee will demonstrate how to perform operational checks and operator maintenance on a multipurpose sweeper
Notes:	
<ul style="list-style-type: none"> • Personnel are required to wear all personal protective equipment pertaining to each task (i.e. work gloves, hearing protection, and safety goggles) 	
<ul style="list-style-type: none"> • Any safety violation is an automatic failure 	

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**PERFORM OPERATIONAL CHECKS
PERFORM OPERATOR MAINTENANCE**

Background: There are several types of vacuum sweepers used by the Air Force. Specific pre-operational inspection procedures for each type can be found in the owner's manual that accompanied the equipment. It is important that this equipment is properly checked and serviced prior to operation. This ensures the equipment will get the job done effectively and as efficiently as possible. The primary sweeper used by the Air Force is the TYMCO Model 600. The TYMCO sweeper is a multipurpose high-speed sweeper, capable of performing both flight line and street sweeping. The design of the TYMCO 600 allows it to maintain cleaner surfaces at higher speeds with lower maintenance costs than other larger, more complex sweepers. It is mounted on a heavy-duty truck chassis and uses an auxiliary engine and blower assembly to operate the sweeper system. In this QTP, we will focus our discussion on the TYMCO 600 sweeper.

When servicing the sweeper, keep safety in mind at all times. Remove jewelry to prevent it from getting caught in moving parts or grounding out the battery. When working around the battery, wear eye protection. Always be aware of hot engine parts and liquids such as coolant and hydraulic fluid. Always turn off the auxiliary engine before doing any work on the pick-up head. Never remove the pressure or suction tubes while the auxiliary engine is running.

To perform the task, follow these steps:

Step 1: Utilize the AF Form 1806.

Check all the items listed that pertain to the sweeper.

Step 2: Inspect the Vehicle Exterior.

Inspection of the vehicle exterior begins with a 360-degree walk around looking for damage and leaks. Check mirrors for cleanliness and cracks. Also look for any damage to the truck and hopper.

HINT:

Puddles of fluid and dirty areas on the engine or ground normally indicate problem areas and should be investigated prior to operation.

Step 3: Inspect Drive Engine Compartment.

Check the engine oil, coolant, brake, power steering and transmission fluid levels, and fill as needed. Inspect drive belts for wear, tension and alignment. Ensure battery connections are secure and free from corrosion.

Step 4: Inspect the Auxiliary Engine.

Check the engine oil, fuel and coolant for proper levels. Inspect the drive belts for wear, tension and alignment. Ensure battery connections are secure and free from corrosion. Inspect the exhaust system to ensure it is not damaged or loose.

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Step 5: Inspect Sweeper Unique Items.

The following items are unique to the TYMCO sweeper and are not listed on the AF Form 1806, but must be checked during the pre-operational inspection. Add them to the AF Form 1806 in the space provided for the additional items. Check the gutter brooms for wear and adjustment. Examine the seals on the hopper and inspection doors. Check the pick-up head for damage. Ensure the water system's nozzles, filters and screens are free from dirt and debris. Ensure the dust separator screen is not damaged and close the inspection/rear doors. Inspect the hand suction hose for dry rot or any damage to the hose or metal tube.

Step 6: Perform Required Operator's Maintenance.

Operator maintenance is required to ensure the sweeper is properly lubricated and serviced. Refueling it at the end of each working day prevents moisture from condensing and forming droplets within the fuel tank. It also allows the sweeper to be used in emergency conditions without requiring extra time to refuel. Air intake breathers are of special importance. They should not be clogged with dirt or dust. If they are clogged, they need to be cleaned or replaced immediately. Ensure all fluids are at the correct level. Add coolant to the radiator(s), fill the crankcase with oil, and fill the batteries as needed. Replace broken lenses and burnt out bulbs. You also want to add air to the tires if they are low. If a tire is damaged or worn take it to maintenance so they can change the tires. Ensure all nuts and bolts are tightened. Keep the sweeper clean by washing and waxing it. Just remember, never wash the inside of the cab, this shortens the life of the vehicle cab and causes the floor mats to deteriorate and the floorboards to rust. Replace the gutter broom bristles when they are worn to within 5 inches or less. Also clean around the gutter broom hydraulic motor shafts. Finally, adjust the gutter brooms and pick-up head as necessary (use the operators manual for technical guidance on how to adjust these items).

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**Review Questions
for
Perform Operational Checks
Perform Operator Maintenance**

Question	Answer
1. The drive belt inspection is required on the drive engine only.	a. True b. False
2. Which of the following is not an inspection item performed on both the drive and auxiliary engine compartments?	a. Oil b. Leaks c. Coolant d. Brake Fluid
3. Which AF Form is the vehicle inspection guide that should be used to inspect the multipurpose sweeper?	a. AF Form 171 b. AF Form 373 c. AF Form 1800 d. AF Form 1806
4. The gutter brooms should be inspected for wear and adjustment during the pre-operational inspection.	a. True b. False

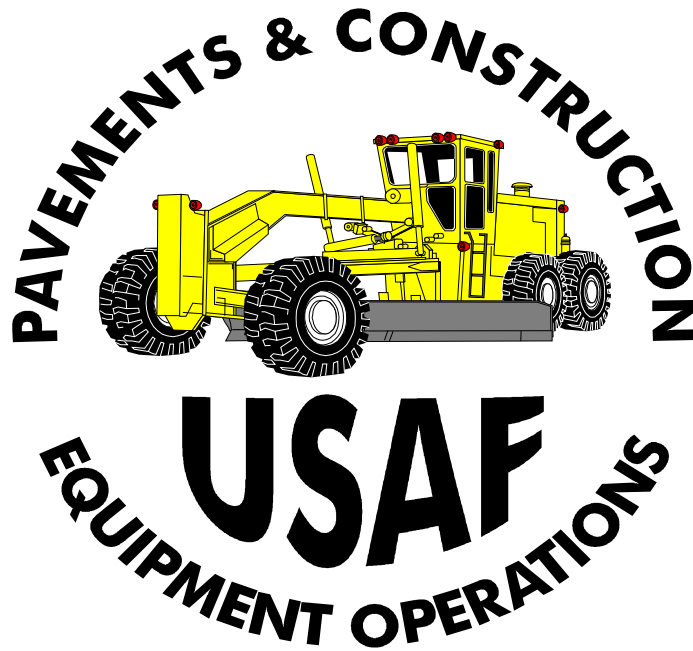
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PERFORM OPERATIONAL CHECKS

PERFORM OPERATOR MAINTENANCE

Performance Checklist		
Step	Yes	No
1. Utilized AF Form 1806 as an inspection guide?		
2. Inspected vehicles exterior?		
3. Inspected drive engine compartment?		
4. Inspected auxiliary engine compartment?		
5. Inspected sweeper unique items?		
6. Performed all required maintenance?		

FEEDBACK: Trainer should provide positive and/or negative feedback to the trainee immediately after the task is performed. This will ensure the issue is still fresh in the mind of both the trainee and trainer.



OPERATE ON:

MODULE 18

AFQTP UNIT 3

STREET

(18.3.2.2.)

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**OPERATE ON:
STREET**

Task Training Guide

STS Reference Number/Title:	18.3.2.2. Street
Training References:	<ul style="list-style-type: none"> • 36C25 Series • Owner's Manual • Local Procedures
Prerequisites:	<ul style="list-style-type: none"> • Possess as a minimum a 3E2X1 AFSC
Equipment/Tools Required:	<ul style="list-style-type: none"> • Multipurpose Sweeper • Personal Protective Equipment
Learning Objective:	<ul style="list-style-type: none"> • The trainee will be able to operate a multipurpose sweeper on base streets.
Samples of Behavior:	<ul style="list-style-type: none"> • The trainee will demonstrate how to properly operate a multipurpose sweeper on base streets.
Notes:	
<ul style="list-style-type: none"> • Personnel are required to wear all personal protective equipment pertaining to each task (i.e. work gloves, hearing protection, and safety goggles) 	
<ul style="list-style-type: none"> • Any safety violation is an automatic failure. 	

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OPERATE ON: STREET

Background: The Air Force has always had a policy to maintain high standards of cleanliness. To maintain these high standards, base streets and parking lots must be swept on a regular basis. Where does most of the litter on any base end up? It ends up on the street against the curb. Sweeping litter and keeping streets and parking lots clean, improves morale of base personnel, helps prevent illness, and keeps the base looking nice.

Street conditions are the major factor determining sweeping speeds. Be sure to watch for parked vehicles and debris. Pay special attention to uneven road surfaces, potholes, pedestrians, and other heavy objects that may damage the pick-up head. When sweeping streets with curbs and gutters, steering accuracy is very important. Damage can be avoided by sweeping at 3 to 5 mph with the bristles 1 to 2 inches up the face of the curb. On streets and parking lots without curbs, speeds can range up to 10 mph.

During operation, varying debris loads may require changes to the blower RPM. The blower can be safely operated between 1800-2500 rpm. If you operate the blower above 2500 rpms you could possibly damage the engine. For light debris operate the blower at closer to 1800rpms. For heavy debris run the blower at 2500 rpms. The advantage of using the higher rpm is better cleaning ability. The disadvantage is it causes accelerated wear on the engine and the blower. For optimum sweeping efficiency, set the rpm at 2000.

As you are sweeping, you may encounter large objects such as large rocks, crates, wood, or boxes that will not fit under the pickup head. You need to, stop the sweeper, pick up the object, and deposit the object in the hopper through the right or left side inspection door. Another area of concern is sweeping through standing water or over wet pavement. This will not damage the sweeper, but you need to be conscious of the fact that the sweeper has the ability to remove water from the surface rapidly. Therefore it may require frequent dumping to remove the water from the hopper.

NOTE: DO NOT drive in reverse with your pickup head in the down position. This will cause damage to the drag links and possibly the pickup head itself.

To perform the task, follow these steps:

Step 1: Perform pre-operational inspection.

Refer to module 18, Units 3 (p. 18) for proper inspection maintenance procedures

Step 2: Start the truck (drive) engine.

Ensure parking break is set and transmission is in neutral

Step 3: Turn on safety flashers and beacon.

Step 4: Start auxiliary engine.

Set engine speed at idle.

SAFETY:

PICK-UP HEAD SHOULD ALWAYS BE GROUNDED IF ENGINE IS ABOVE IDLE.

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Step 5: Lower pick-up head to pavement, then pull forward 2-3 feet.

Step 6: Increase blower RPM to the desired setting.

1800-2500 RPM depending on amount/type of debris.

Step 7: Engage gutter broom(s), if necessary.

Step 8: Utilize water system.

To turn on the water system, engage the main water system switch, press the prime button, and engage the water switch desired (pick-up head, gutter brooms, and/or hopper). Use the water spray system to control dust when you are sweeping in dusty conditions.

HINT: Do not use the water system in freezing weather conditions.

Step 9: Start Sweeping.

Step 10: General Shutdown Procedures.

If gutter brooms are used, raise them, and pull forward 4 to 6 feet. This action allows the debris kicked under the sweeper to be removed by the pickup head. Next, decrease the auxiliary engine RPM, raise the pick-up head, turn off the water system, and shut down the auxiliary engine. Finally, turn off the beacon/safety flashers. Now you are ready to drive the sweeper to another area that needs to be swept or to the wash area to clean it.

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**Review Questions
for
Operate on:
Street**

Question	Answer
1. What is the first step in sweeping operations?	a. Pre-operational check b. Lower pick-up head to ground c. Start the engine d. Turn on water system
2. When sweeping streets with curbs and gutters, damage to the equipment can be avoided by driving _____ MPH.	a. 1-3 b. 1-5 c. 3-5 d. 3-7
3. What is the optimum blower rpm for sweeping efficiently?	a. 1800 b. 2000 c. 2200 d. 2500

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**OPERATE ON:
STREET**

Performance Checklist		
Step	Yes	No
1. Preformed Pre-operational inspection?		
2. Started Engine correctly?		
3. Turned on safety flashers and beacon?		
4. Started auxiliary engine?		
5. Lowered pick-up head and pulled forward 2-3 feet?		
6. Increased blower setting to recommended rpm?		
7. Engaged gutter broom(s)?		
8. Engaged water system, (if temperature is above 32°)?		
9. Conducted proper sweeping?		
10. Followed general shutdown procedures?		

FEEDBACK: Trainer should provide positive and/or negative feedback to the trainee immediately after the task is performed. This will ensure the issue is still fresh in the mind of both the trainee and trainer.

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MULTI-PURPOSE SWEEPERS

MODULE 18

AFQTP UNIT 3

CHANGE BROOMS (18.3.4.)

**MAKE ADJUSTMENTS TO:
BROOM (18.3.6.2.)**

CHANGE BROOMS

MAKE ADJUSTMENTS TO: BROOM

Task Training Guide

STS Reference Number/Title:	18.3.4. Change Brooms 18.3.6.2. Make Adjustments To: Broom
Training References:	<ul style="list-style-type: none"> • 36C25 Series • Owner's Manual • Local Procedures
Prerequisites:	<ul style="list-style-type: none"> • Possess as a minimum a 3E231 AFSC
Equipment/Tools Required:	<ul style="list-style-type: none"> • Multipurpose Sweeper • Personal Protective Equipment • General Tool Kit • Gutter Broom Bristles
Learning Objective:	<ul style="list-style-type: none"> • The trainee will be able to properly change and adjust a gutter broom on a multipurpose sweeper
Samples of Behavior:	<ul style="list-style-type: none"> • The trainee will demonstrate how to change and adjust a gutter broom on a multipurpose sweeper
Notes:	
<ul style="list-style-type: none"> • Personnel are required to wear all personal protective equipment pertaining to each task (i.e. work gloves, hearing protection, and safety goggles) 	
<ul style="list-style-type: none"> • Any safety violation is an automatic failure 	

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CHANGE BROOMS

MAKE ADJUSTMENTS TO: BROOM

Background: The TYMCO gutter broom system is designed for effectiveness and ease of service. Use caution when working around gutter brooms since bristles can cause serious cuts and punctures. The only adjustments the operator should be concerned with are the angle, tilt, and spring adjustment. Angle refers to adjusting the broom from front to rear. Tilt refers to adjusting the broom left to right. The spring adjustment dictates the amount of down pressure applied. All three adjustments affect the sweeping pattern of the gutter broom bristles.

The sweeping pattern for the gutter broom bristles must be adjusted to gutter conditions on your particular base. However, for most applications you should adjust the left broom to the 9 and 2 o'clock position and the right broom to the 10 and 3 o'clock position. Typically, these adjustments properly position the bristles for effective cleaning.

SAFETY:

- **DO NOT SERVICE GUTTER BROOM ASSEMBLY WHILE IT IS ENGAGED AND ROTATING.**
- **ENSURE AREA IS CLEAR BEFORE LOWERING OR RAISING THE GUTTER BROOM.**
- **DO NOT STEP OR STAND ON THE GUTTER BROOM.**

To perform the tasks, follow these steps:

Step 1: Gutter Broom Bristle Replacement.

Replace bristles when worn down to 5 inches or less in length.

Step 2: Spring Adjustment.

A heavy-duty spring is used for gutter broom down pressure and compensating for bristle wear. For normal conditions, set the gutter broom down pressure with the broom in the neutral position. Tighten or loosen the nut on the spring eyebolt so the broom bristles are from 1 to 2 inches above the ground. The spring eyebolt nut is also used to adjust the gutter broom for bristle wear. As bristles are worn, you need to loosen the nut on the spring eyebolt to lower the gutter brooms down so that they are within the 1 to 2 inches above ground requirement.

HINT:

The spring eyebolt nut must be re-tensioned when a new set of bristles are installed. Failure to do so will result in rapid wear of the new bristles.

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Step 3: Prepare Gutter Broom for Adjustment.

With main engine off, start the auxiliary engine and place the gutter broom in the down position. Once down, place the gutter broom control lever in the neutral position so the broom is not rotating, then turn the auxiliary engine off.

Step 4: Loosen bolts.

There are two 5/8-inch bolts behind the hydraulic motor to adjust the angle and four 5/8-inch bolts on the side of the boom to adjust the tilt. These bolts must be loosened to adjust the gutter broom angle and tilt.

Step 5: Adjust broom.

Once the bolts are loose, adjust the broom for the desired tilt by pushing down on the outside edge of the gutter broom plate. Then tighten the four 5/8-inch bolts to hold the pattern.

Step 6: Adjust angle bracket.

To reduce the angle or flatten the gutter broom pattern, follow the same procedure for loosening the gutter broom angle bracket. Lift up on the outside edge of the gutter broom plate to reduce the angle as desired and then tighten the two 5/8-inch front bolts.

**Review Questions
for**

CHANGE BROOMS

**MAKE ADJUSTMENTS TO:
Broom**

Question	Answer
1. For most gutter sweeping operations, what is the normal adjustment for the left gutter broom?	a. 9 and 1 o'clock b. 9 and 2 o'clock c. 10 and 2 o'clock d. 10 and 3 o'clock
2. When in the neutral position, a properly adjusted gutter broom spring eyebolt is tightened or loosened so the bristles are _____ inches above the ground.	a. 1-2 b. 1-3 c. 2-3 d. 2-4
3. The Gutter Broom should be replaced when the bristles are ____ or less in length.	a. 3" b. 4" c. 5" d. 6"
4. There is never a situation in which the gutter broom assembly should be serviced while it is engaged and rotating.	a. True b. False

CHANGE BROOMS

**MAKE ADJUSTMENTS TO:
BROOM**

Performance Checklist		
Step	Yes	No
1. Checked bristle length and replaced if necessary?		
2. Adjusted spring?		
3. Prepared gutter broom for adjustments?		
4. Loosened bolts?		
5. Adjusted broom to proper setting?		
6. Adjusted angle brackets to proper setting?		

FEEDBACK: Trainer should provide positive and/or negative feedback to the trainee immediately after the task is performed. This will ensure the issue is still fresh in the mind of both the trainee and trainer.



MULTI-PURPOSE SWEEPERS

MODULE 18

AFQTP UNIT 3

CHANGE WEARING SURFACES (18.3.5.)

MAKE ADJUSTMENTS TO: HOOD (18.3.6.1.)

CHANGE WEARING SURFACES

MAKE ADJUSTMENTS TO: HOOD

Task Training Guide

STS Reference Number/Title:	18.3.5. Change Wearing Surfaces 18.3.6.1. Make Adjustments to Hood
Training References:	<ul style="list-style-type: none">• 36C25 Series• Owner's Manual• Local Procedures
Prerequisites:	<ul style="list-style-type: none">• Possess as a minimum a 3E2X1 AFSC
Equipment/Tools Required:	<ul style="list-style-type: none">• Multipurpose Sweeper• Personal Protective Equipment• General Tool Kit• Hood Replacement Parts
Learning Objective:	<ul style="list-style-type: none">• The trainee will be able to properly change wearing surfaces and make adjustments to the hood on a multipurpose sweeper
Samples of Behavior:	<ul style="list-style-type: none">• The trainee will demonstrate how to change the wearing surfaces and make adjustments to the hood on a multipurpose sweeper
Notes:	
<ul style="list-style-type: none">• Personnel are required to wear all personal protective equipment pertaining to each task (i.e. work gloves, hearing protection and safety goggles)• Any safety violation is an automatic failure	

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CHANGE WEARING SURFACES

MAKE ADJUSTMENTS TO: HOOD

Background: As the sweeper operator, you are responsible for changing the wearing surfaces on the sweeper. The wearing surfaces are designed to protect the overall condition of the sweeper. If they wear down too far, the pickup head or gutter brooms may be damaged. To prevent any damage, you need to replace the curtains and skid plates on the pickup head and the bristles on the gutter brooms.

If the pick-up head and gutter brooms are not properly adjusted, sweeping efficiency will suffer. Therefore, the sweeper operator is responsible for making the appropriate adjustments.

To perform the task, follow these steps:

Step 1: Ensure sweeper is properly parked.

Should be parked on a level surface.

Step 2: Remove the pickup head from the sweeper.

Start the auxiliary engine and raise the pickup head. Shut off the engine and remove the flotation springs (Put each clevis in the chain-link it was removed from). Start the auxiliary engine and lower the pickup head. Shut off the engine again, then remove the following: pressure and suction tubes, lift chains, drag links, center debris deflector curtain, pressure bleeder cable, and water line. Put all pins, bolts and screws back on the parts so they do not get lost. Next, pull the pickup head out from under the left side of the sweeper and turn it upside down so that you can work on the bottom of it. NOTE: Due to the excessive weight of the pickup head, you will need additional help to move it.

Step 3: Remove the curtains.

Pay particular attention to the placement of the angle brackets (they MUST be put back in the same position later). Remove the self-tapping screws and inspect them for wear. Replace the screws if necessary. Remove the curtains. There are six of them: a front 10 inch light curtain, a front 10 inch heavy curtain, a suction baffle curtain, two each rear 8 inch curtains, and a blast orifice curtain.

Step 4: Replace the curtains.

Replace all curtains with the thick rubber part of the curtain pointed toward the front and the cords toward the rear of the pick up. Remember to use new self-tapping screws if the old ones are worn down too far

Step 5: Replace skid plates (if necessary).

Remove the bolts on the side of the pickup head to remove the skid plates. Install new skid plates and retighten the bolts.

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Step 6: Make adjustments as needed.

Measure and adjust the blast orifice, blast orifice skid guards, and the skid plates. The most critical adjustment on the pickup head is the blast orifice opening. The blast orifice opening on the pick-up head directs the high velocity air from the blower at about a 45-degree angle to the ground. The blast orifice opening must be 5/8-inch wide. A larger opening will result in reduced velocity and poor sweeping performance. If the gap is not 5/8-inch wide, loosen the nine carriage bolts securing the blast orifice assembly and position it to achieve a 5/8-inch opening, hold and retighten the nuts. There are two blast orifice skid guards that prevent damage to the blast orifice gap. The minimum distance allowed between the bottom of the blast orifice skid guards and the bottom of the skid plates is 1/8-inch. The blast orifice skid guards are welded into place; therefore, the skid plates must be adjusted to ensure the correct spacing. To adjust the skid plates, loosen the five bolts on each side of the pick-up head. The skid plate runners must be set level with each other. The skid plates can also be adjusted to handle all types of debris (Figure 1). To change the pickup head debris setting, adjust the skid plates to achieve the desired tilt for type of debris.

Step 7: Reassemble pickup head on the sweeper.

Turn pickup head over and slide under the left side of the sweeper. Reconnect the water line, pressure bleeder cable, center debris deflector curtain, drag links, lift chains, pressure and suction tubes.

Step 8: Lower the pickup head and pull sweeper forward to seat the curtains.**Step 9: Perform the rocker test.**

Standing on one side of the sweeper, reach down and grab the front and rear of the pickup head and try to rock it. If the skid plates are not properly adjusted it will rock.

Step 10: Make adjustments to the left skid plate only.

Make adjustments if necessary. Then perform test again. If it no longer rocks, move on to the next step, otherwise make additional adjustments until it no longer rocks.

Step 11: Raise pickup head and reconnect flotation springs.**Step 12: Perform one-hand lift test.**

With the truck moving forward slowly, the pickup head lowered, and the auxiliary engine running at 2000 RPM, try to lift the left front corner of the pickup head. You should be able to lift it easily, with very little effort. If not, you have to adjust the flotation springs by loosening or tightening the eyebolts. If adjustments are made, perform one hand lift test again. If the front of the skid plate is nose-diving, causing the rear of the skid plate to kick up, more front spring tension is needed. For minor adjustments, tighten the spring eyebolt nut. For major adjustments, change the chain link. The left front of the pick-up head requires the most spring tension. This is to counter the air blast from the blower motor. As a result, the left front spring has the smallest chain link extension of all the flotation springs. Once all adjustments are correct, the pickup head should set level with the curtains properly seated (Figure 2).

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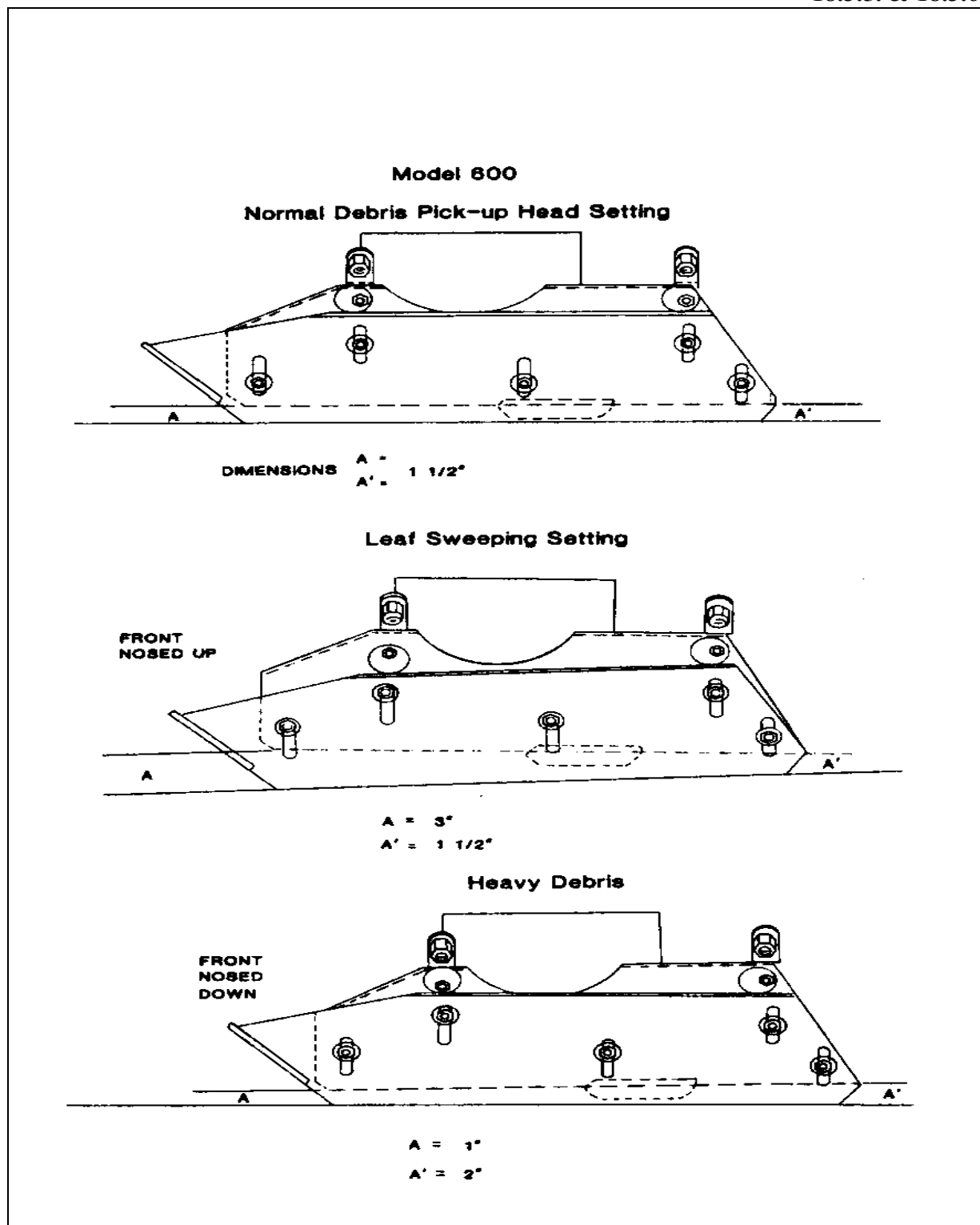


Figure 1. Skid Plate adjustment diagram.

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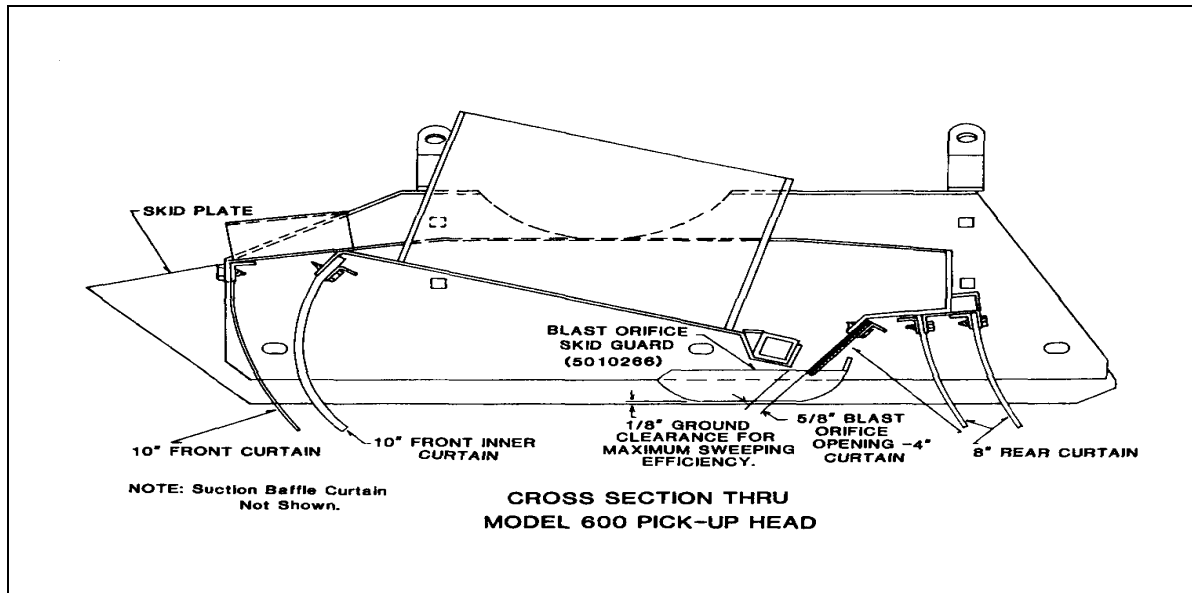


Figure 2. TYMCO air sweeper pickup head diagram.

NOTE:

When the spring tension is set correctly, the head should ride evenly on the pavement and not leave any white scuffmarks on the pavement. The pick-up head should float slightly above the pavement.

**Review Questions
for
Change Wearing Surfaces**

**Make Adjustments To:
Hood**

Question	Answer
1. If the pick-up head is not properly adjusted, sweeping efficiency will suffer.	a. True b. False
2. How many blast orifice skid guards are used to prevent damage to the blast orifice gap?	a. 2 b. 3 c. 4 d. 6
3. At what RPM should the auxiliary engine be running when conducting the one hand lift test?	a. 1000 b. 1500 c. 2000 d. 2200
4. After all the adjustments to the pickup head have been made, the head should be resting lightly on the pavement.	a. True b. False
5. The blast orifice opening on the pickup head is the most critical adjustment, what must that opening be?	a. 1" b. 3/4" c. 5/8" d. 1/2"

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CHANGE WEARING SURFACES

**MAKE ADJUSTMENTS TO:
HOOD**

Performance Checklist		
Step	Yes	No
1. Removed pick up head?		
2. Removed curtains?		
3. Replaced curtains?		
4. Replaced skid plates if necessary?		
5. Made proper adjustments?		
6. Reassembled pickup head to sweeper?		
7. Performed rocker test?		
8. Performed rocker test?		
9. Made additional adjustments to the left skid plate only?		
10. Reattached springs and lowered pick-up head?		
11. Performed one hand lift test and made necessary adjustments?		

FEEDBACK: Trainer should provide positive and/or negative feedback to the trainee immediately after the task is performed. This will ensure the issue is still fresh in the mind of both the trainee and trainer.



MULTI-PURPOSE SWEEPERS

MODULE 18

AFQTP UNIT 3

PERFORM CLEANING OPERATIONS

(18.3.7.)

PERFORM CLEANING OPERATIONS***Task Training Guide***

STS Reference Number/Title:	18.3.7. Perform Cleaning Operations
Training References:	<ul style="list-style-type: none"> • 36C25 Series • Owner's Manual • Local Procedures
Prerequisites:	<ul style="list-style-type: none"> • Possess as a minimum a 3E2X1 AFSC
Equipment/Tools Required:	<ul style="list-style-type: none"> • Multipurpose Sweeper • Personal Protective Equipment • Water Source • Water Hose
Learning Objective:	<ul style="list-style-type: none"> • The trainee will be able to properly clean a multipurpose sweeper
Samples of Behavior:	<ul style="list-style-type: none"> • The trainee will demonstrate how to clean the multipurpose sweeper
Notes:	
<ul style="list-style-type: none"> • Personnel are required to wear all personal protective equipment pertaining to each task (i.e. work gloves, hearing protection and safety goggles) 	
<ul style="list-style-type: none"> • Any safety violation is an automatic failure 	

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PERFORM CLEANING OPERATIONS

Background: Cleanliness is the most important factor in maintaining a multipurpose sweeper. Each operator must clean the sweeper after every shift. First, the sweeper hopper must be dumped. Drive the sweeper to either a landfill or a centralized site to dump the debris out of the hopper. Point the front of the sweeper into the wind to prevent dust and debris from blowing back at the operator. Use caution when backing and watch for any deep holes or objects that may damage the tires or the pick-up head. Next, with the auxiliary engine at idle, open the hopper door to dump the debris. After emptying, close the hopper door, making sure there is no debris obstructing the seals. The debris may cause damage to the seals, affecting the sweeping efficiency of the sweeper. After the hopper is emptied proceed to the wash rack and thoroughly clean the hopper and vehicle exterior with water.

To perform the tasks, follow these steps:

Step 1: Go to designated dumpsite and empty hopper.

Step 2: Drive to wash rack.

Ensure rack is equipped with an oil-water separator and wash the sweeper.

Step 3: Wash inside of hopper.

Open the hopper door and left/right side inspection doors and start cleaning the hopper from the inspection doors with emphasis on the outside of the dust separator door and hopper screen.

Step 4: Open dust separator door and wash.

Step 5: Wash door seals, hopper door, and under the raker plate.

Step 6: Disconnect suction tube from holding straps and wash inside of tube.

Ensure you reattach the suction tube.

Step 7: Wash outside of sweeper.

Step 8: Clean the inside of the cab.

Use cleaning supplies. DO NOT spray water inside the cab.

Step 9: Park sweeper.

Remember that if you have to drive from the wash rack to parking area the hopper needs to be almost closed so that other vehicles can see your rear lights. Park the sweeper with hopper and inspection doors open so the seals will dry and regain shape. Also make sure that the pickup head was lowered and the truck driven forward to properly seat the curtains.

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**Review Questions
for
Perform Cleaning Operations**

Question	Answer
1. In maintaining a multipurpose sweeper, when must the operator clean it?	a. daily b. weekly c. monthly d. after each shift
2. The hopper door will open with power supplied by the drive engine.	a. True b. False
3. When cleaning the multipurpose sweeper, what items should be washed?	a. Door seals b. Raker plate c. Hopper door d. All of the above
4. When parking the sweeper after cleaning, lower the pickup heads and then drive forward slightly to properly seat the curtains.	a. True b. False

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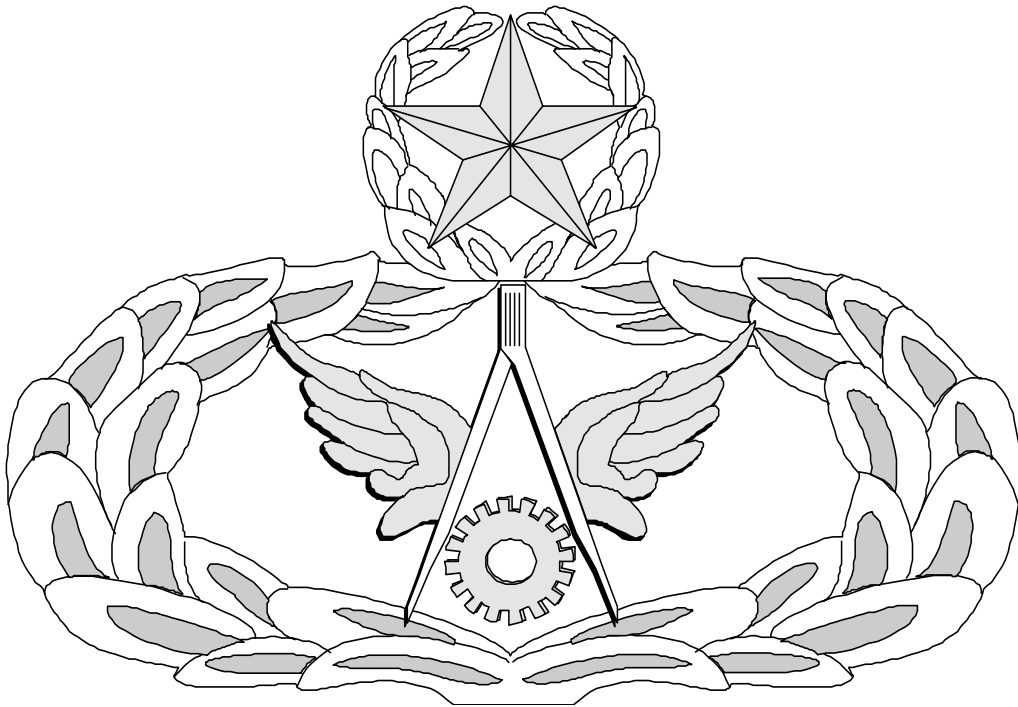
PERFORM CLEANING OPERATIONS

Performance Checklist		
Step	Yes	No
1. Drove to designated dump site and emptied hopper		
2. Drove to wash rack?		
3. Washed inside of hopper?		
4. Opened dust separator door and washed?		
5. Washed door seals, hopper door and under raker plate?		
6. Disconnected suction tube, washed inside of tube?		
7. Washed outside of sweeper?		
8. Left hopper door and inspection doors open?		
9. Cleaned cab?		

FEEDBACK: Trainer should provide positive and/or negative feedback to the trainee immediately after the task is performed. This will ensure the issue is still fresh in the mind of both the trainee and trainer.

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Air Force Civil Engineer
QUALIFICATION TRAINING PACKAGE (QTP)
REVIEW ANSWER KEY



For
PAVEMENTS & CONSTRUCTION EQUIPMENT OPERATOR

(3E2X1)

MODULE 18

SWEEPERS

PERFORM OPERATIONAL CHECKS

(3E2X1-18.3.1.)

PERFORM OPERATOR MAINTENANCE

(3E2X1-18.3.3.)

Question	Answer
1. The drive belt inspection is required on the drive engine only.	a. True
2. Which of the following is not an inspection item performed in both the drive and auxiliary engine compartments?	d. Brake fluid
3. Which AF Form is the vehicle inspection guide that should be used to inspect the multipurpose sweeper?	d. AF Form 1806
4. The gutter brooms should be inspected for wear and adjustment during the pre-operational inspection.	a. True

**OPERATE ON:
STREET
(3E2X1-18.3.2.2.)**

Question	Answer
1. What is the first step in sweeping operations?	a. Pre-operational check.
2. When sweeping streets with curbs and gutters, damage to the equipment can be avoided by driving _____ MPH.	c. 3-5
3. What is the optimum blower rpm for sweeping efficiently?	b. 2000

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CHANGE BROOMS
(3E2X1- 18.3.4.)

MAKE ADJUSTMENTS TO:
BROOM
(3E2X1-18.3.6.2.)

Question	Answer
1. For most gutter sweeping operations, what is the normal adjustment for the left gutter broom?	b. 9 and 2 o'clock
2. When in the neutral position, a properly adjusted gutter broom spring eyebolt is tightened or loosened so the bristles are _____ inches above the ground.	a. 1-2
3. The Gutter Broom should be replaced when the bristles are ____ or less in length.	c. 5"
4. There is never a situation in which the gutter broom assembly should be serviced while it is engaged and rotating.	a. True

**CHANGE WEARING SURFACES
(3E2X1- 18.3.5.)**

**MAKE ADJUSTMENTS TO HOOD
(3E2X1-18.3.6.1.)**

Question	Answer
1. If the pick-up head is not properly adjusted, sweeping efficiency will suffer.	a. True
2. How many blast orifice skid guards are used to prevent damage to the blast orifice gap?	a. 2
3. At what RPM should the auxiliary engine be running when conducting the one hand lift test?	c. 2000
4. After all the adjustments to the pickup head have been made, the head should be resting lightly on the pavement.	b. False
5. The blast orifice opening on the pickup head is the most critical adjustment, what must that opening be?	c. 5/8"

PERFORM CLEANING OPERATIONS

(3E2X1- 18.3.7.)

Question	Answer
1. In maintaining a multipurpose sweeper, when must the operator clean it?	d. After each shift.
2. The hopper door will open with power supplied by the drive engine.	b. False
3. When cleaning the multipurpose sweeper, what items should be washed?	d. All of the above
5. When parking the sweeper after cleaning, lower the pickup heads and then drive forward slightly to properly seat the curtains.	a. True

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